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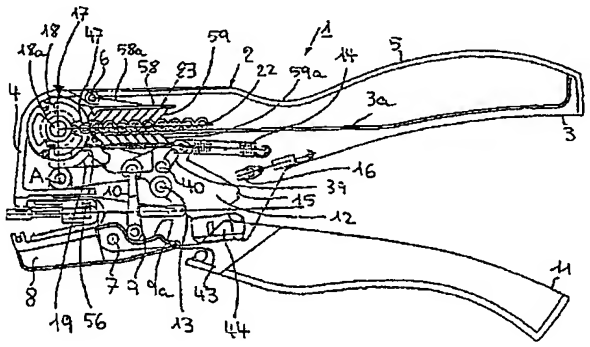
(54) MANCHONS D'EXTREMITE DE NOYAU LIES ENTRE EUX POUR FORMER UNE COURROIE ET DISPOSITIF DE TRANSPORT POUR CES MANCHONS

(54) CORE END SLEEVES WHICH ARE LINKED TO ONE ANOTHER IN THE FORM OF A BELT AND DEVICE FOR THEIR TRANSPORTATION

(57)

The invention relates to core end sleeves which are linked to one another in the form of a belt. Each of the sleeves has a metal sleeve portion in a front region thereof and a plastic sleeve portion which partially overlaps the metal sleeve. The plastic sleeves are each provided with a projection associated with the rear of the sleeve and rests on an outer side of the belt. The height of the projection at right angles to the plane of the belt, is independent of the diameter of the plastic sleeves. Core end sleeves for different conductor cross- sectional dimensions can thus be transported using one and the same core end sleeve guide track having a guide groove on its one side wall for the projections.



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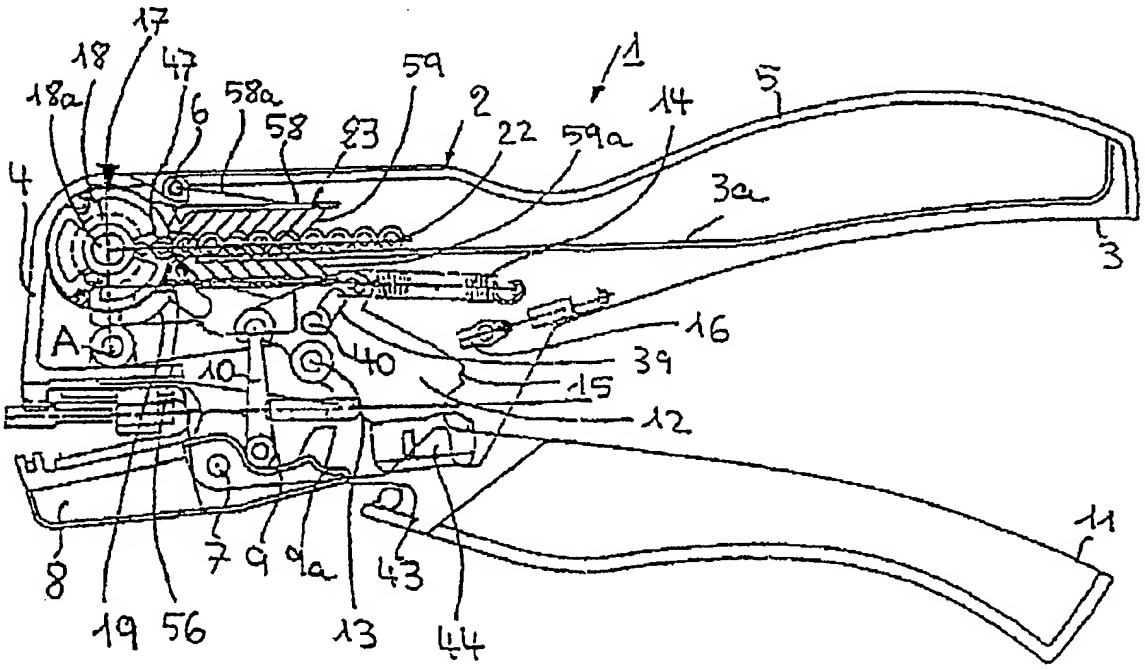

(57) Abrégé/Abstract:
The invention relates to core end sleeves which are linked to one another in the form of a belt. Each of the sleeves has a metal sleeve portion in a front region thereof and a plastic sleeve portion which partially overlaps the metal sleeve. The plastic sleeves are each provided with a projection associated with the rear of the sleeve and rests on an outer side of the belt. The height of the projection at right angles to the plane of the belt, is independent of the diameter of the plastic sleeves. Core end sleeves for different conductor cross-sectional dimensions can thus be transported using one and the same core end sleeve guide track having a guide groove on its one side wall for the projections.

ABSTRACT

The invention relates to core end sleeves which are linked to one another in the form of a belt. Each of the sleeves has a metal sleeve portion in a front region thereof and a plastic sleeve portion which partially overlaps the metal sleeve. The plastic sleeves are each provided with a projection associated with the rear of the sleeve and rests on an outer side of the belt. The height of the projection at right angles to the plane of the belt, is independent of the diameter of the plastic sleeves. Core end sleeves for different conductor cross-sectional dimensions can thus be transported using one and the same core end sleeve guide track having a guide groove on its one side wall for the projections.

Core End Sleeves which are Linked to One Another in the Form of a Belt, and Device for Their Transportation

The invention relates to core end sleeves linked to one another in the form of a belt; more particularly, this invention relates to a device for transportation of core end sleeves which are linked to one another in the form of a belt.

A known crimping device is disclosed in EP-A1-0,327,452, by means of which core end sleeves which are initially linked to one another in the form of a belt which can be crimped onto stripped conductor ends. The core end sleeves in each case have a metal sleeve in the front region and a plastic sleeve, which particularly engages over the metal sleeve and is permanently connected to it, in the rear region. In this arrangement, the core end sleeves are connected to one another via the plastic sleeves.

The core end sleeves, which are linked to one another in the form of a belt, are guided in a groove-shaped guide track which includes a base and mutually opposed side walls. The distance between the side walls in this case corresponds to the length of the core end sleeves which are transported at right angles to their longitudinal direction. In general, it is necessary to use core end sleeves of different thicknesses for conductors of different cross-sectional dimensions, and as such, different and replaceable guide tracks are provided for known crimping devices. Each core end sleeve guide track is suitable for holding only one size of core end sleeves and accordingly, the guide track must be changed whenever end sleeves of a different size are used.

The present invention advantageously provides end sleeves which can be transported in one and the same core end sleeve

guide track regardless of the cross-sectional size of the conductor onto which they are intended to be crimped; one aspect of the present invention is to provide a guide track of the core end sleeve transportation device such that this is achieved.

According to the invention, the plastic sleeves of the core end sleeves are provided on the rear end thereof with a projection which points to the rear and rests on an outer side of the belt.

In a preferred embodiment, the guide track of the transportation device is constructed such that one of the side walls has a guide groove which is incorporated in an extension of the base. The groove is used to hold the projections of the core end sleeves in a fitting manner during transportation along the guide track.

A further aspect of the invention is to provide a plurality of core end sleeves releasably linked to one another in the form of a belt, the sleeves having a metal portion in a front region thereof and a plastic portion connected to the metal portion, the sleeves being releasably linked via each the plastic portion and including a projection, each projection adapted for resting on an outer side of the belt.

The core end sleeves, which are linked to one another in the form of a belt, are pushed into the guide track to enable the respective projections to come to rest on the base of the guide track. In this manner, the projections project into the guide groove. The length of the core end sleeves, seen without the projection, is similar to the distance between the side walls of the guide track, so that the core end sleeves can be transported

along the track at right angles to their longitudinal direction and in the belt longitudinal direction, without excessive play in their longitudinal direction. Accordingly, the height of the guide groove at right angles to the base of the guide track is similar to the corresponding height of the projections, and thus, the core end sleeves are held at right angles to the base of the guide tracks, virtually without any play.

For crimping core end sleeves of different sizes, for example, with conductor cross-sections of 0.5 mm^2, 0.75 mm^2, 1.0 mm^2, 1.5 mm^2 and 2.5 mm^2, the height of the respective projection at right angles to the plane to the belt is independent of the diameter of the plastic sleeves, thus enabling the same core end sleeve guide track to be used for transportation of core end sleeves of a different size.

As previously mentioned, the distance between the side walls of the guide track is similar to the length of the core end sleeves, seen without the projection. Core end sleeves for conductors having different conductor cross-sectional dimensions thus have the same length.

According to a further aspect of the present invention, there is provided a transportation device for transporting core end sleeves each having at least one projection, the sleeves being releasably linked to one another in the form of a belt, the device including a guide track having a base and mutually opposed side walls for guiding the sleeves, one of the side walls having a guide groove for holding a projection of each sleeve of the sleeves in a fitting manner during transportation along the guide track.

However, they may also be of different lengths if the

plastic sleeves are the same length for all cross-sectional sizes. In this case, the core end sleeves can be locked in their longitudinal direction by means of a step which is present in the longitudinal groove direction of the guide track. The length of the plastic sleeves, seen without the projection, then corresponds to the distance between the step and that side wall in which the longitudinal groove is located. The metal sleeves then come to rest above the step. In this case, the metal sleeve of the core end sleeve for the smallest conductor cross-section may lie directly on the step, while the metal sleeves of core end sleeves for larger conductor cross-sections are located at a distance above the step.

According to one advantageous embodiment of the invention, the plastic sleeves may have a perforated slot, running from a rear end of the sleeve and in the longitudinal direction of the belt, in order to form the projection. In this arrangement, there are virtually two projections, the projection located further from the base of the guide track not being used, however, to guide the core end sleeves. The perforated slot has a greater or lesser width depending on the size or diameter of the plastic sleeves, so that the height of the projections, running at right angles to the plane of the belt, corresponds to the height of the guide groove in every case. As a result of the perforated slot, (which runs symmetrically with respect to the plastic sleeves), the core end sleeve belt can be pushed into the guide track by means of one of its ends, which otherwise would not be possible with only one projection. The projections are injection-moulded at the same time as the production of the plastic sleeves.

In order to hold the projections of the core end sleeves inside the guide groove, there may also be provided elastic pressure elements on the side wall of the guide track opposite

the guide groove, particularly in the end region of the guide track. In most cases, even more precise positioning of the core end sleeves is necessary there, because they are transferred from the end of the guide track into the depression of a crimping device.

The crimping device may, for example, comprise a crimping drum having different depressions for core end sleeves of different sizes. The use of an elastic pressure element is particularly advantageous if the crimping drum moves in an axial direction once a depression has been loaded with a core end sleeve; the crimping drum being removed from the side wall having the guide groove and taking the core end sleeve belt with it. If the core end sleeve which is located in the depression is not separated from the belt until later, (e.g. by suitable rotation of the crimping drum) the displaced core end sleeve belt must be moved back into the original position again, which is carried out by the elastic pressure element. This pressure element presses the core end sleeves back against the side wall containing the guide groove and thus presses the projections into the guide groove again. In sequence, the core end sleeves are thus precisely positioned for the next loading process.

For better positioning of the core end sleeves in the end region of the guide track, the base can be provided with a row of teeth at the end of the guide track. The row of teeth may also be used to lock the core end sleeves when a core end sleeve transportation device is removed from the crimping drum as described hereinafter.

A blade may be located in the base region at the end of the guide track, which blade separates the core end sleeves from one another when the crimping drum rotates; at the same time, the

sleeve which is loaded in the depression is moved past the blade.

In order to load the depression with a core end sleeve, the above-mentioned transportation device for feeding the core end sleeves in a step-by-step manner may be located above the guide track. This transportation device is preferably driven in synchronism with the crimping drum, or is controlled by its rotation. Accordingly, the process system can be synchronized quite easily.

Having thus generally described the invention, reference will now be made to the accompanying drawings, illustrating preferred embodiments and in which:

Figure 1 illustrates a sectional view of combination tongs having a cutting station, stripping station and crimping station;

Figure 2 illustrates the crimping station with the adjacent core end sleeve transportation station in a perspective representation;

Figure 3 illustrates a perspective view of two core end sleeves, according to the invention, which are linked to one another like a belt;

Figure 4 illustrates a perspective representation of the crimping drum and core end sleeve transportation station with the transportation plate; and

Figure 5 illustrates a different embodiment of the core end sleeve transportation station.

Figure 1 shows tongs 1, or combination tongs, in which the

transportation device, according to the invention, is located for the transportation of core end sleeves linked to one another in the form of a belt. Thus the core end sleeves can be processed according to the invention using tongs 1.

The tongs 1 consist of a tong body 2 to which an upper handle 3, which is stationary relative to the tongs body 2, is integrally connected. The tong body 2 and the upper handle 3 together form a common cavity. A stationary clamping jaw 4 is fitted to the front lower end of the tong body 2. The upper part of the upper handle 3 is constructed as a cover 5 which can rotate and is supported such that it can pivot about a shaft 6 which is attached to the tong body 2. Located in the upper handle 3 is a base 3a which, together with the cover 5 and a part of the tongs body 2, forms a cavity for holding a supply of core end sleeves 22 which are linked to one another in the form of a belt.

Located on the lower part of the tong body 2 are bearing pins 7 about which a moving clamping jaw 8 is supported in such a manner that it can pivot. This clamping jaw 8 has control surfaces 9,9a which are aligned to the tongs body 2 and which are located on the side of the bearing pin 7 which points towards the handle end of the tongs 1. The moving clamping jaw 8 is rotated or driven around the bearing pin 7 via a joined lever 10 which runs on the control surfaces 9 and 9a.

A lower handle 11 of the tongs 1 is integrally connected to a drive member 12, which is joined to the tong body 2, via the bearing pin 13, so that it can rotate. The joined lever 10 is connected to the drive member 12 at a point which is located at the front and in front of the bearing pin 13 with respect to the tongs 1. When the handles 3 and 11 are moved towards one

another, the level 10 runs off on the control surfaces 9 and 9a such that the clamping jaws 4 and 8 are initially closed and subsequently opened again when the level 10 acts on the control surface 9a. A tension spring 14, which is tensioned between the drive member 12 and the tong body 2, is used to return the handles 3 and 11 to the original position (opened position). A tooth gap 15 on the drive member is used together with a locking hook 16, supported so as to rotate in a resiliently moving manner on the tong body 2, in order to lock the handles 3 and 11 in the pressed-together state.

Together with other components, the clamping jaws 4 and 8 form a stripping station for stripping the insulation of a conductor end; there is also a further cutting station provided in the lower region of the tong body 2, for cutting through electrical leads. A blade 44, which is attached to the tong body 2, and a counter-bearing 43 in the handle 11, form part of this cutting station.

A crimping station 17, shown more clearly in Figure 2, is arranged in the part of the tong body 2 located at the top and at the front thereof. The crimping station has a crimping drum 18 which can rotate about a shaft 18a attached to tong body 2. A crimping lever 19 is provided to pivot about a shaft A which is attached to the tong body 2; the crimping lever 19 is provided with a crimping stamp 56. The free end of the crimping lever 19 engages via a pin 40 in a bent guide track 39 which in turn is located inside the drive member 12. If the handles 3 and 11 are moved towards one another, then a controlled movement of the crimping lever also takes place, and, thus the crimping stamp 56 moves in the direction of the crimping drum 18.

As is illustrated in Figure 2, crimping drum 18 has a

plurality of depressions 47, 48, 49, which are distributed uniformly around its circumference. These depressions are used for holding core end sleeves 22 (described hereinafter) which have different cross-sections. As an example, core end sleeves for conductor cross-sections of 0.5 and 0.75 mm^2 can be positioned in the depression or recesses 47, while depression 48 is suitable for holding core end sleeves for conductor cross-sections of 1.0 and 1.5 mm^2. The depression 49 would then be constructed for holding core end sleeves for conductor cross-sections of 2.5 mm^2.

In Figures 1 and 2, depression 47 is illustrated in a loading position in which a core end sleeve 22 can be received from a supply and transportation station 23. If a stripped conductor end is inserted into the core end sleeve located in depression 47, then the crimping drum 18 can be pressed to the rear in the axial direction, so that the conductor end acts on a locking lug 52 and takes the crimping drum 18 with it, via the lug. There are locking lugs 52 in each case at the end of each of the depressions 47, 48 and 49. In the event of such an axial displacement of the crimping drum 18, the drum is coupled to a transportation lever (not shown) and, for its part, is connected to the drive part 12 via a pin which projects into an angled guide track. The crimping drum 18 is coupled to the transportation lever via projections 54 which run axially on the rear side of the crimping drum 18 and of which, in each case, one has a depression allocated to it.

If the crimping drum 18 is coupled to the drive part 12 via the transportation lever, then the drum is rotated in the clockwise direction when the handles 3 and 11 are pressed together. At the same time, the depression 47 is rotated out of the loading position into a crimping position. Once the

depression 47 has reached the crimping position, then the crimping stamp 56 is guided into the crimping position when the handles 3 and 11 are pressed together further, so that the conductor end and core end sleeve are crimped to one another. When handles 3 and 11 are released, the crimping stamp 56 is initially moved from the crimping position, while the crimping drum 18 is subsequently rotated back in the opposite direction, so that the depression 47 moves out of the crimping position into the loading position again. During this entire rotation process of the crimping drum 18, the drum is locked in its axially displaced position, and more specifically by the locking lugs 52 which engage behind suitable locking walls 53 fixed to the housing, (illustrated in Figure 4) and discussed hereinafter in greater detail.

In the un-displaced position, the crimping drum 18 can be rotated by hand, if it has not been loaded with a core end sleeve, so that a desired depression 47, 48 or 49 may be moved into the loading position. The selected position is locked via projections 50 which are present on the front side of crimping drum 18 and are pressed into corresponding openings on the inner wall of the tongs 2. For this purpose, a spring can be arranged between the rear side of the crimping drum 18 and the rear housing wall of the tong body 2, by means of which spring the crimping drum 18 is also pushed forwards when the locking lugs 52 project behind the locking walls 53.

As can be seen in Figures 1 and 4, the supply and transportation stations 23 for the core end sleeves 22 are arranged in the front region of the base 3a and adjacent to the crimping drum 18. The supply and transportation station 23 has a transportation station 58 (transportation device) for the step-by-step feeding of the core end sleeves 22. The transportation

plate 58 is pretensioned in the direction of the crimping drum 18 with the aid of a spring 58a. On its undersurface, the transportation plate 58 is provided with flexible elastic lugs 59 which may be metal or plastic, and act on the core end sleeves 22. The transportation plate 58 is located essentially parallel to the base 3a, with the lugs 59 pointing obliquely forward in the direction of the crimping drum 18. As a result of parallel displacement of the transportation plate 58 away from the crimping drum 18 and towards the crimping drum 18, the core end sleeves 22 can thus be carried with it and at the same time displaced in the direction of the crimping drum 18. If the transportation plate 58 is moved away from the crimping drum, then the lugs 59 merely slide away and over the core end sleeves, without displacing them. In contrast, during movement of the transportation plate 58 in the opposite direction, the entire core end sleeve belt is taken with it. The foremost core end sleeve is thus moved into a depression which is located in the loading position at this time. In this case, the crimping drum has not yet been axially displaced. Elastic lugs 59a can likewise project from below through the base 3a and run obliquely with respect to the crimping drum 18. These lugs are intended to prevent movement of the core end sleeves 22 in a direction away from the crimping drum. These elastic lugs 59a are permanently positioned.

As an alternative to elastic lugs 59a, the base 3a may also have a row of teeth 64a, for example three or more teeth (Figure 4), which prevents simultaneous movement of the core end sleeves 22. At the same time, the first tooth of the row of teeth 64a, which is adjacent to the crimping drum 18, can be larger or higher then the other teeth in order to obtain an initial position which is as defined as possible for the core end sleeves which are to be loaded.

Figure 4 shows the construction of the transportation plate 58 in more detail. In particular, transportation plate 58 has an inclined surface 61 on the front side. If the crimping drum 18 is displaced axially to the rear during insertion of a conductor end into a depression, then one of the projections 54 comes to rest above the inclined surface 61. During subsequent rotation of the crimping drum 18, a displacement of the transportation plate 58 away from the crimping drum 18 then takes place, since the projection 54 now acts on the inclined surface 61, and, by means of the latter, presses or displays the transportation plate 58 away. The lugs 59 then slide elastically away over the core end sleeve belt which is located in the supply and transportation station 23, but tension it in the direction of the crimping drum because of its springing effect.

When the crimping drum 18 is rotated in a clockwise direction, the core end sleeve in the depression is initially moved into the vicinity of a blade 63, which is fixed to the housing, and is cut off by the blade from the rest of the core end sleeve belt before it reaches the crimping position. The blade is shown in Figure 2.

If the crimping drum 18 is rotated back into its initial position after completion of the crimping process, then the projection 54 initially releases the inclined surface 61. However, in this case, the transportation plate 58 has not yet moved back to the crimping station 18, since the depression has not yet reached the loading position. Rather, the next core end sleeve initially comes to rest only on the circumference of the crimping drum 18.

As soon as the depression reaches the loading position, the movement of the transportation plate 58 is released since the

depression space is now available for the next core end sleeve. The spring 58a can thus pull transportation plate 58 in the direction of the crimping drum 18 and hence load the depression with the next core end sleeve. At the same time, the crimping drum 18 is in its forwardly displaced position, at which point it no longer engages with the transportation lever.

Figure 5 shows a further embodiment of the supply and transportation device 23 in the region of its transportation plate 58b. Instead of the lugs or brushes, the transportation plate 58b carries on the undersurface thereof an elastic or flexible spring element 58c of e.g., spring steel, plastic, etc. The spring element 58c has a horizontal arm 58d which can rest on the core end sleeve belt and to press the core end sleeves 22 against bed 3a or 64. An arm 58e, of the spring element 58c extends obliquely forwardly from above or in the direction of the crimping drum 18 in contrast engages in the region between the core end sleeve 22 which is located next to the crimping drum 18 and the subsequent core end sleeve. By virtue of this arrangement the first-mentioned core end sleeve is pushed into the depression (in this case 47) which is located in the loading position when the spring element 58c with the transportation plate 58b is moved towards the crimping drum 18. The arm 58e is located in front of the horizontal arm 58d, viewed in the feed direction.

During movement of the transportation plate 58b in the opposite direction, the horizontal arm 58d slides away over the core end sleeves without taking them with it. The arm 58e and the horizontal arm 58d may also be present as separate elements and may be connected to the transportation plate 58b. By means of teeth 64a, having a longitudinal direction running parallel to the longitudinal direction of the core end sleeves, the core

end sleeves are prevented from moving when the transportation plate 58b is removed from the crimping drum 18.

Figure 2 shows a more detailed outline of a core end sleeve guide track of the supply and transportation device 23. The core end sleeve guide track 63 is constructed in a groove shape. The groove itself has a rectangular cross-section and is formed by a base 64 and mutually opposed side walls 65 and 66. The base 64 can come to rest in the extension of the base 3a.

The core end sleeves 22 which are linked to one another in the form of a belt are transported in the longitudinal direction of the core end sleeve guide track 63 or in the groove direction, with the individual core end sleeves 22 coming to rest with their longitudinal direction at right angles to the longitudinal direction of the core end sleeve guide track 63. The core end sleeves 22 are connected to one another in a suitable manner, such as described hereinafter.

A guide groove 67, which is located in the side wall 65, is used for guiding the core end sleeves 22 inside the core end sleeve guide track 66. This guide groove 67 is obtained by extending the base 64 into the side wall 65 and has a groove height h at right angles to the base 64. The guide groove 67 extends over the entire length of the core end sleeve guide track, and is parallel to it.

The other side wall 66 of the core end sleeve guide track 63 is provided in its front region with an elastic or flexible pressure element 68, which has a pretensioned resiliently in the direction of the side wall 65. This elastic pressure element 68 may be, for example, a lug which is formed from spring steel and is connected to the side wall 66. The elastic pressure element

68 is used to press the core end sleeves 22, and the core end sleeve belt, against the side wall 65 after the crimping drum 18 has been displaced to the rear in the axial direction and the core end sleeve belt has hence also been displaced in the front region of the core end sleeve guide track 63. The core end sleeves in the front region of the core end sleeve guide track then no longer rest entirely on the side wall 65 so that, after separation of the core end sleeve which is located in the depression 47 from the core end sleeve belt, a backward or reverse movement of the remaining core end sleeves 22 is thus necessary in the direction of the side wall 65. A new loading process then takes place when the crimping drum 18 has been moved back into its axial original position again, after backwards rotation. The depression 47 and the next core end sleeve are now aligned with one another.

The base 64 is bent downwards in the front region of the core end sleeve guide track 63 and in the vicinity of the crimping drum 18 in order to form a projection 69 for holding the previously-mentioned blade. Figure 4 shows that the transportation plate 58 can be supported directly on the core end sleeve guide track 63 in the region of the side wall 66.

Referring now to Figure 3, the construction of the core end sleeves is shown according to the invention for use in the core end sleeve guide track illustrated in Figure 2. According to Figure 3, each core end sleeve 22 comprises in a preferred form a metal sleeve 70 which is located forwardly or in the front region of sleeve 22 and of a plastic sleeve 71, which in turn is located in the region partially engaging overlapping metal sleeve 70 and permanently connected thereto. The plastic sleeves 71 are connected to one another via plastic webs 62. These webs 62 are cut with the aid of the blade 63 during rotation of the crimping

drum 18 and may be located at the front or rear in the longitudinal direction of the plastic sleeve 71.

Located on the rear end of the plastic sleeve 71, i.e. on the end of the plastic sleeve 71 facing away from the metal sleeve 70, there is preferably a projection 72 which is integrally connected to the plastic sleeve 71. Projection 72 may be regarded as an extension, pointing to the rear, of the plastic sleeve 71 and, has the external circumferential shape of the plastic sleeve 71. The projection 72 rests on an external belt surface related to the plane of the belt set by the core end sleeves 22. In other words, the core end sleeves which are linked to one another in the form of a belt are located inside the core end sleeve guide track 63, then the projections 71 come to rest on the base 64 of the core end sleeve guide track 63. In this case, the projections 72 engage in the guide groove 67 and thus have a height H running at right angles to the plane of the belt and to the base 64, which height is matched to the groove height h. The height H of the projections 72 is in this case somewhat smaller than the groove height h, so that the projections 72 can be transported in the longitudinal direction of the guide groove 67 with only a small amount of play. In this case, the length of the core end sleeves 22 is selected such that the free tips of the metal sleeves 70 are guided through the side wall 66 located opposite the groove 67. Reliable transportation of the core end sleeves 22 in the longitudinal direction of the core end sleeve guide track 63 or in the groove direction is thus possible.

The projections 72 can be obtained, for example, by each plastic sleeve 71 being provided with a cut-away portion thus forming a slot 73 which extends from its rear end and which lies in a longitudinal direction of the belt. In this case, another

projection is obtained which is opposite the projection 72, but which is not used for guide purposes.

Core end sleeves 22 for conductor cross-sections of different sizes can be guided with the aid of the core end sleeve guide track 63, for example core end sleeves 1.0/1.5 mm^2 and 2.5 mm^2. Thus, although the core end sleeves have different diameters for different conductor cross-sections, the projections 72 on the rear end of plastic sleeves 71 are always provided with the same or constant height "H", so that all the projections can be guided in the side wall 65 with the aid of the guide groove 67 in every case, regardless of the size of the conductor cross-section provided for the core end sleeves. The core end sleeves 22 for the various conductor cross sections, preferably have the same axial length, so that the side wall 66, which is opposite the groove 67, of the core end sleeve guide track 63 can also be used for guiding the core end sleeves. Apart from the projection, the length of the core end sleeves 22 now corresponds to the distance of the side wall 65 and 66 from one another, regardless of the conductor cross-section provided for said sleeves.

Although embodiments of the invention have been described above, it is not limited thereto and it will be apparent to those skilled in the art that numerous modifications form part of the present invention insofar as they do not depart from the spirit, nature and scope of the claimed and described invention.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A plurality of core end sleeves releasably linked to one another in the form of a belt, said sleeves having a metal portion in a front region thereof and a plastic portion connected to said metal portion, said sleeves being releasably linked via each said plastic portion and including a projection, each said projection adapted for resting on an outer side of said belt.

2. The core end sleeves according to claim 1, wherein the plastic sleeves each a cut-away portion in forming said projection.

3. The core end sleeves according to claim 2, wherein said plastic sleeves each include a cut-away portion associated with a rear portion of each of said sleeves and in the longitudinal direction of the belt.

4. The core end sleeves according to claim 1 or 2, wherein a height of the projection extending is independent of a diameter of said plastic sleeves.

5. A transportation device for transporting core end sleeves each having at least one projection, said sleeves being releasably linked to one another in the form of a belt, said device including a guide track having a base and mutually opposed side walls for guiding said sleeves, one of said side walls having a guide groove for holding a projection of each sleeve of said sleeves in a fitting manner during transportation along said guide track.

6. A device according to claim 5, wherein said device includes an elastic pressure element, said element being pretensioned in a direction of said guide groove, at least in an

end region of one of said side walls opposite said guide groove.

7. A device according to claim 5 or 6, wherein said transportation device is moveable in a reciprocating manner and is supported above said guide track for step-by-step feeding of said core end sleeves.

8. A device according to claim 5 or 6, wherein said base is provided on an end of said guide track with a row of teeth for preventing said core end sleeve belt from sliding backwards when said transportation device is returned to a load position.

9. A device according to claim 7 or 8, wherein said transportation device includes an undersurface, said undersurface supporting a plurality of elastic lugs, said lugs positioned parallel to one another and pointing obliquely downwardly along said guide track.

10. A device according to claim 7 or 8, wherein said transportation device includes an elastic bracket on its undersurface, said bracket including a rear horizontal arm and an arm which is located at the front in the feed direction and projects obliquely downwardly in said feed direction.

11. A device according to claim 10, wherein said elastic bracket comprises spring steel.

12. A device according to claim 5, 6 or 10, wherein said device includes a blade for separating said plastic sleeves from one another adjacent said end of said guide track proximate said base.

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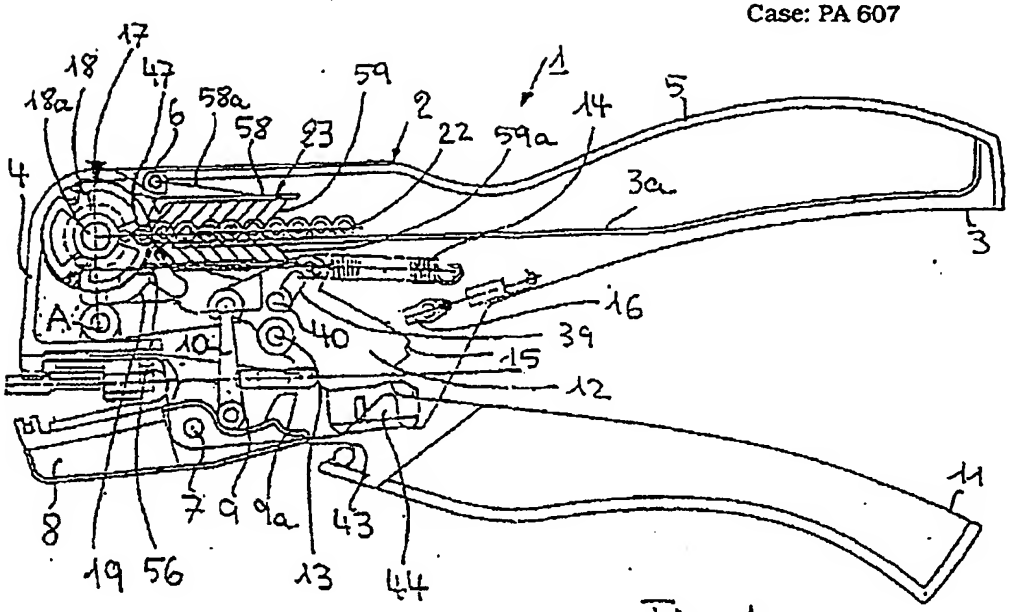

Fig. 1

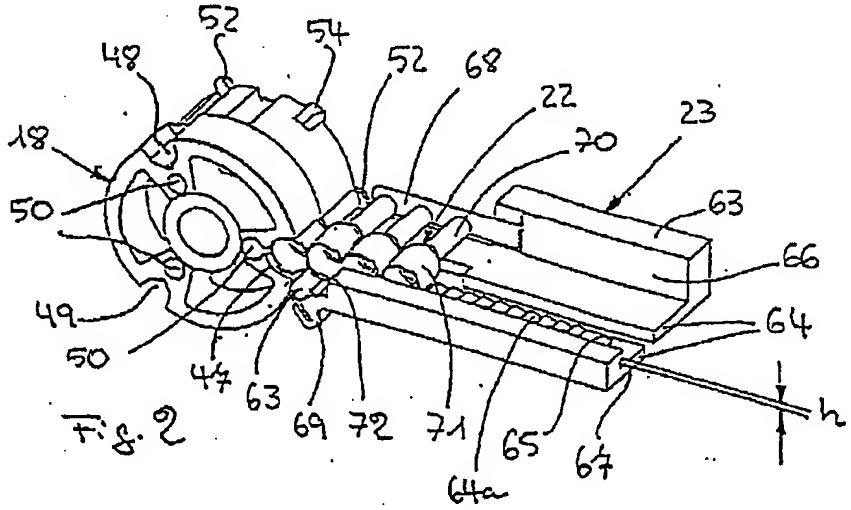

Fig. 2

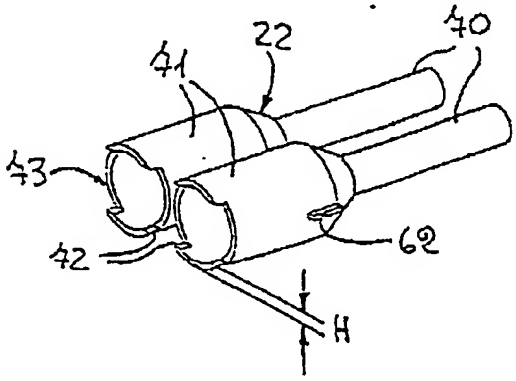

Fig. 3

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Fig. 4

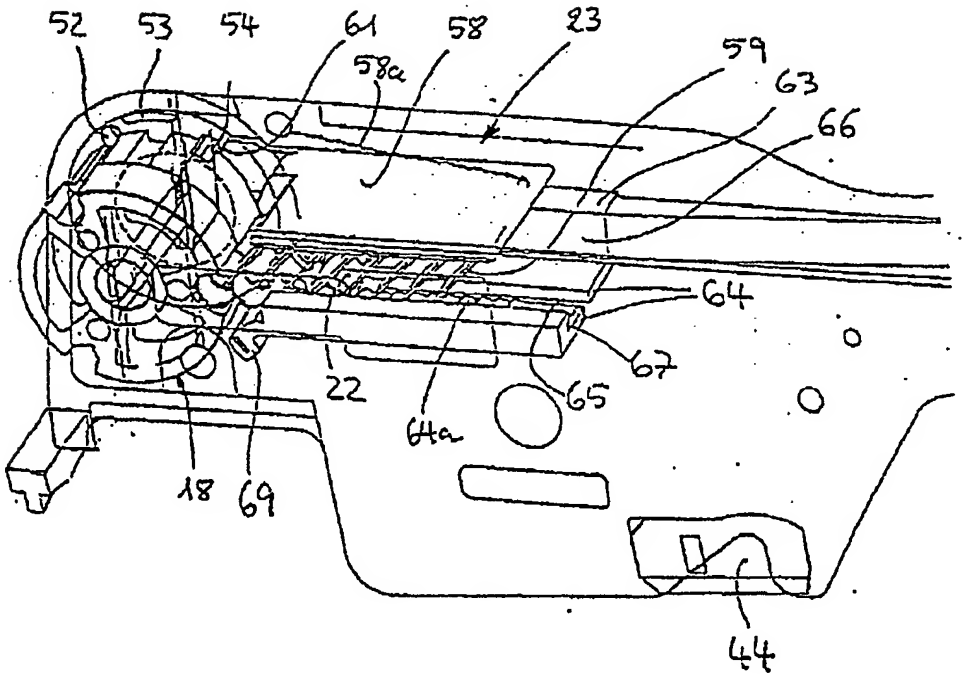

Fig. 5